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Tree Pest Leaflets

EASTERN SPRUCE BARK BEETLE

(*Dendroctonus piceaperda* Hopkins)

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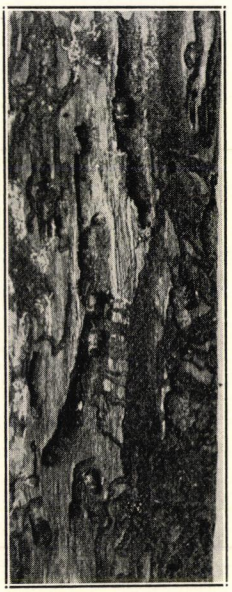

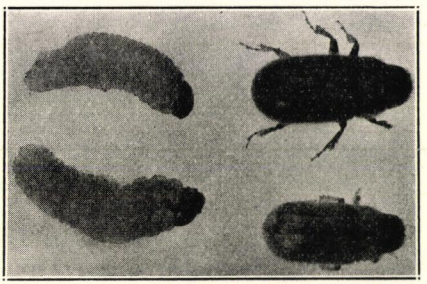

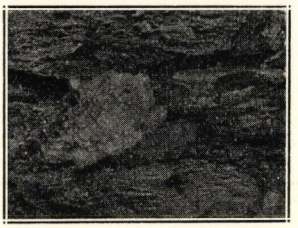

Tunnels on inner side of bark (x 2/3)
Adults and grubs (x 3.5)
Pitch tube on exterior of bark (natural)

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EASTERN SPRUCE BARK BEETLE

(*Dendroctonus piceaperda* Hopkins)

History and Distribution:—Outbreaks of this native, primary pest of spruce have occurred from time to time for many years in the spruce forests of eastern United States and Canada.

Host Trees:—Living, dying, and recently killed specimens of our native spruces—red (*Picea rubra*), black (*P. mariana*), and white (*P. glauca*). Old, dead trees are ignored.

Symptoms:—The foliage of infested trees becomes yellowish-green to reddish-brown in color. Small circular holes extend through the bark and small masses or tubes of pitch are plainly evident on the lower trunk of trees attacked when living. Where the sap was no longer flowing at the time of attack, as on recently killed or down trees, no pitch tube is formed. Instead, only a small amount of fine, brownish, sawdust-like material is present about the holes through the bark. Hence when individual trees are observed the presence or absence of pitch tubes is a good indicator as to whether the tree was alive when the beetles entered. Bark becomes flaked off by woodpeckers in seeking the insects for food. There is often an abundant shedding of green needles which covers the ground beneath newly infested trees. Beneath the bark can be seen extensive tunnels containing grubs and beetles.

Cause:—The small, curved, legless grubs are white with brown head. The beetles are about $\frac{1}{4}$ inch in length and vary from a light brown color to dark reddish brown or black. They are cylindrical and "thick-set" appearing. They crawl slowly and can fly about to attack surrounding trees.

Injury:—These insects in effect cause girdling of living trees by tunneling between the bark and the wood. Adult tunnels are more or less vertical. The grubs tunnel somewhat horizontally; and, because of this, do the most damage. The insect is particularly injurious as old, mature trees are most susceptible to successful attack. Trees with lessened vigor and decreased flow of resin are unable to ward off repeated attacks by the insects as is sometimes the case with younger, thrifty trees which may surround and suffocate the beetles with pitch when they enter the bark.

Conditions Favorable:—The insects breed readily in dying or severely weakened trees such as fire-scorched, or severely defoliated spruce as well as in windfalls, stumps, and logs left in the woods. After breeding numerously in the above material they fly to and successfully attack living trees nearby. In outbreaks, spruce from the particularly susceptible mature trees down to those eight inches D. B. H., and sometimes even as small as four inches D. B. H., may be attacked. *Stands of large spruce should therefore be watched* for presence of this pest especially after severe wind-storms, fires, logging operations, or outbreaks of defoliating insects. It is important to apply control methods when infestations are first starting in relatively few trees.

Life Cycle:—Adult beetles emerge from infested material over the summer and fly to nearby trees on which they enter the bark by making a circular entrance tunnel through to the wood. A pair of beetles makes each tunnel. The egg tunnel is next made for several inches up the tree between the bark and the wood. Along the sides of this the female lays numerous eggs. After the eggs are laid the beetles often desert their first egg tunnels to make new ones in the same or nearby trees. Eggs are again laid after which the adults die. Grubs, which hatch from the eggs, tunnel individually in the inner bark and next to the wood at nearly right angles to the egg tunnel to cause a girdling effect around the tree. Transformation to adult beetles takes place in the tunnels. The insects overwinter beneath the bark either as adults or larvae depending upon the time the eggs from which they developed were laid.

Control:—*Forest*:

Natural control factors consist of destruction of this pest by parasitic and predatory insects which usually kill but a small percentage; and by woodpeckers which in their usual abundance destroy a considerable percentage of the total. Competition of the broods with their own kind and other species of bark beetles is undoubtedly also a controlling factor. Yet even with these agencies, the destruction of spruce can only be prevented by applying artificial control methods.

Artificial control consists of cutting infested trees in fall and winter and treating them *before spring*. In a regular cutting operation in an outbreak the customary removal of the logs from the woods or

floating them in water should be sufficient. When relatively few trees are involved, all infested trees should be cut and before spring either treated as above or else sawed, piled about the stump, and burned sufficiently to destroy the insects beneath the bark. In either case a trained man should be present to mark all infested trees which should be cut very low. Dead trees killed previously may be left. Treated areas should be watched in succeeding years to make sure control has been successful. Dying of spruce should be reported immediately by all woods-workers.

Individual Trees:—Shade or ornamental trees if kept in a thrifty condition are rarely attacked.

Possible Practices:—A promising method of treating beetle infested trees has been worked out on other bark beetles and should have the same effect on this species. It consists of introducing zinc chloride (preferably) or copper sulphate into the sap stream around the complete circumference at the base of a tree. The sap carries the chemical throughout the tree killing all insect life. The use of the chemical kills the tree and prevents further attack by insects and fungi.

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